

## Selective reflection from Rb vapor

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Selective reflection (SR) spectroscopy deals with atoms travelling close to dielectric surface. Their collisions with it lead to subdoppler narrowing of the resonance lines [1]. The shift of line positions due to atom – surface interaction was observed [2]. The elegant theory of SR was presented in [3] together with a SR spectra in Rb for vapor densities from  $3 \times 10^{14}$  to  $2.7 \times 10^{17} \text{ cm}^{-3}$  [4]. In theoretical model for high vapor densities the atom – wall interactions, exponential attenuation of light, self-consistent Lorentz–Lorenz corrections and velocity changing collisions were included. But there was still some discrepancy between theory and experimental data.

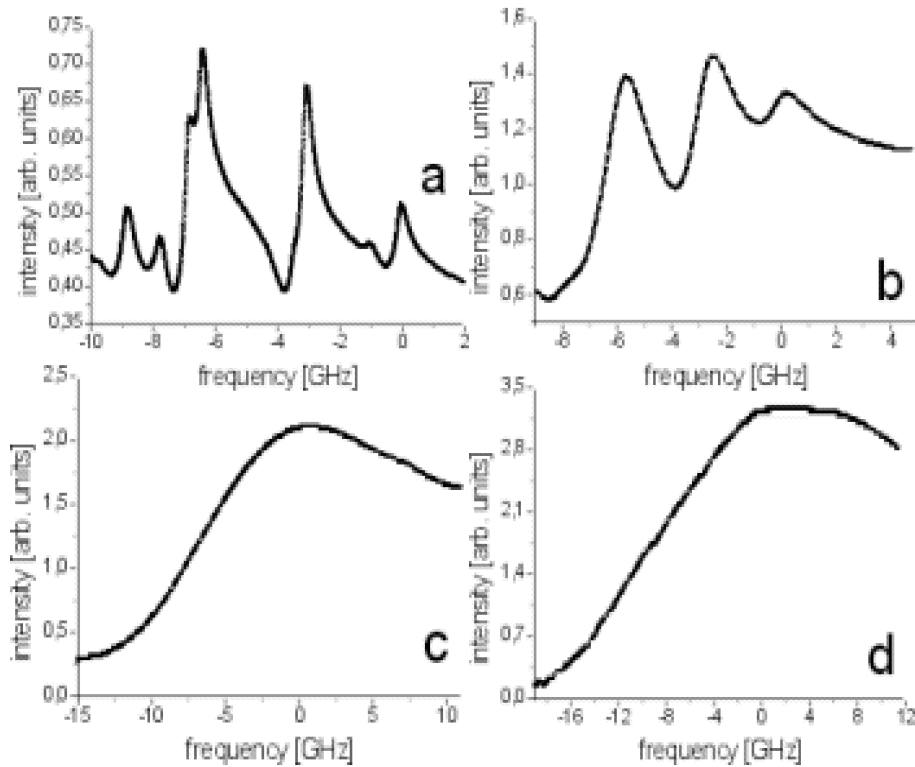


Figure 1: Line shape of SR for the Rb  $D_1$  line at atomic vapour density (a)  $8 \times 10^{14}$ ; (b)  $2 \times 10^{16}$ ; (c)  $1.5 \times 10^{17}$ ; (d)  $1 \times 10^{18}$ .

Last time we bought the safire cell with Rb vapor in the Institute of Physical Research of National Academy of Sciences in Armenia. The cell enables us to achieve the temperatures up to  $650 \text{ }^\circ\text{C}$ , which corresponds to the vapor pressure of  $5 \times 10^{18} \text{ cm}^{-3}$ .

We present our SR spectra of Rb for high vapour pressure. The laser power was in the range of  $4.5 \text{ W} \cdot \text{cm}^{-2}$ . We hope this data will help to solve the problem which corrections should be included in theoretical treatment.

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